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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,858	02/12/2004	W. Denis Markiewicz	FSU 10419.2	7172
321	7590	06/23/2005	EXAMINER	
SENNIGER POWERS LEAVITT AND ROEDEL ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			ROJAS, BERNARD	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/777,858

Applicant(s)

MARKIEWICZ ET AL.

Examiner

Bernard Rojas

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 20 and 21 is/are allowed.
- 6) ☒ Claim(s) 1-19, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, filed 06/06/2005, with respect to a 112 rejection on claims 1-23 have been fully considered and are persuasive. The 112 rejection of claims 1-23 has been withdrawn.

Applicant's arguments filed 06/06/2005 have been fully considered but they are not persuasive. Applicant urges Koyama et al. [US 5,606,300] in view of ITO [JP 58,194,309 A] does not disclose the claimed invention. As applied, ITO teaches wrapping the outer surface of the coil wire a high tension reinforcement wire, therefore the outer surface of the coil is in direct contact with the reinforcement wire. To apply the reinforcement technique of ITO in order to gain its benefits, the superconducting coil of Koyama et al. would be wrapped in the reinforcement wire and then the coil/reinforcement wire assembly would be covered with epoxy. Therefore the rejection of claims 1-19 under Koyama et al. in view of ITO are deemed proper.

### ***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama et al. [US 5,606,300] in view of ITO [JP 58,194,309 A].

Claims 1, Koyama et al. discloses a superconducting magnet comprising a plurality of superconducting coils [figure 2], said coils [8] being impregnated with epoxy [7] and nested within each other, an innermost one of the nested coils having a bore there through defining a bore width of the magnet, said bore width being greater than approximately 100 millimeters, said nested coils being electrically connected in series and cooled to an operating temperature less than approximately 4 degrees K [abs].

Koyama et al. discloses the claimed invention with the exception of an external reinforcement on the coil.

ITO discloses a superconducting coil with a reinforcement wire [6] wound around the outer surface of the coil.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to wrap the outer surface of the coil of Koyama et al. with a reinforcement wire as taught by Ito in order to prevent the movement of a superconductive wire due to electromagnetic force thereby improving stability [ITO abs].

Claim 2, is a product-by-process claim. As previously discussed, Koyama et al. in view of ITO discloses the structure of at least one superconducting coil being impregnated with epoxy.

Claims 3 and 4, is a product-by-process claim. As previously discussed, Koyama et al. in view of ITO discloses the claimed invention.

Claim 5, ITO discloses that the external reinforcement includes a reinforcement wire wound around the at least one of the superconducting coils to be reinforced [figure 2].

Claim 6. ITO discloses that the reinforcement wire is electrically insulated [abs, wire is made of fiber reinforced plastic]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have this insulation withstand high temperatures since it is well known the superconducting coils create large amounts of heat.

Claim 7, ITO discloses the high temperature insulation as a fiber. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a glass fiber braided around the plastic, since applicant has not disclosed that a glass fiber braid solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the disclosed fiber reinforcement.

Claim 8, ITO discloses that the reinforcement wire is electrically insulated to prevent electrical short circuits of the reinforcement wire to itself [abs, wire is made of fiber reinforced plastic].

Claims 9 and 10, ITO fails discloses the reinforcement wire is steel or steel and copper. Instead ITO discloses a reinforcement wire is a fiber reinforced plastic. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a steel or steel and copper wire in order to improve the coils thermal characteristics since a steel or steel and copper wire would dissipate more of the heat produced by the coil than a fiber reinforced plastic wire.

Claim 23, Koyama et al. discloses a superconducting magnet comprising a plurality of superconducting coils [figure 2], said coils [8] being impregnated with epoxy [7] and nested within each other, said nested coils being electrically connected in series and cooled to an operating temperature less than approximately 4 degrees K [abs].

Koyama et al. fail to teach an external reinforcement of the coil.

ITO discloses a superconducting coil with a reinforcement wire [6] wound around the outer surface of the coil.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to wrap the outer surface of the coil of Koyama et al. with a reinforcement wire as taught by Ito in order to prevent the movement of a superconductive wire due to electromagnetic force thereby improving stability [ITO abs].

The functional recitation that the reinforcement is "for providing structural reinforcement to the magnet in both radial and axial direction" has not been given patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a "means" for performing the specified function, as set forth in 35 USC, 112, 6th paragraph, and must be supported

by recitation in the claim of sufficient structure to warrant the presence of the functional language. *In re Fuller*, 1929 C.D. 172; 388 O.G. 279.

Claims 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama et al. [US 5,606,300] in view of ITO [JP 58,194,309 A] and in further view of Huang et al. [US 6,147,844 A].

Claim 12, Koyama et al. in view of ITO discloses the claimed invention with the exception of an active protection circuit for protecting one or more of the coils in response to a quench in the magnet

Huang et al. discloses an active protection circuit [figures 2 and 3] for protecting one or more of the coils in response to a quench in the magnet, said protection circuit including at least one heater element for heating the protected coil [figure 1]

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the quench protection of Huang et al for the superconductive coil of Koyama et al. in order to reduce to possibility of damage to the superconductive coil due to quenching.

Claims 13-16, Koyama et al. in view of ITO in further view of Huang et al. disclose the claimed invention except for the design of the heater element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to alter the design of the heater element, i.e. a substantially flat metallic braid or a resistive metal, in order to obtain a desired heating characteristic. Since applicant has not disclosed that any of the claimed heater compositions solves any stated problem or

is for any particular purpose and it appears that the invention would perform equally well with the disclosed heater composition.

Claim 17, is a product-by-process claim. Huang et al. discloses the heater element is positioned in thermal contact with the protected coil [abs].

Claim 18, is a product-by-process claim. Huang et al. discloses the heater element is positioned in thermal contact with the protected coil [abs].

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama et al. [US 5,606,300] in view of Ackermann et al. [5,552,211].

Claim 22, Koyama et al. discloses a superconducting magnet comprising a plurality of superconducting coils [figure 2], said coils [8] being impregnated with epoxy [7] and nested within each other, an innermost one of the nested coils having a bore there through defining a bore width of the magnet, said bore width being greater than approximately 100 millimeters, said nested coils being electrically connected in series and cooled to an operating temperature less than approximately 4 degrees K [abs].

Koyama et al. discloses the claimed invention with the exception of the coil lead support.

Ackermann et al. discloses a superconducting magnet with a coil lead support [10, figure 2] supporting each of the lead wires adjacent an end of the superconductive coil [24], the lead support including a stabilizing member [84, 86, 94] securing a portion of at least one of the lead wires [48, 54].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a lead support as taught by Ackermann et al. to the



Art Unit: 2832

superconducting magnet of Koyama et al. in order to protect the superconductive leads against shock and vibration while in the device and provide thermal isolation [abs].

***Allowable Subject Matter***

Claims 20 and 21 are allowed.

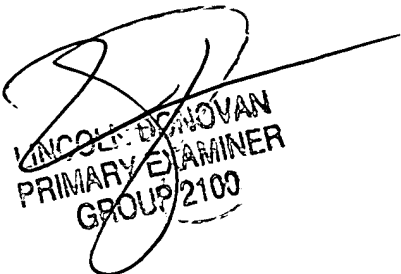
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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